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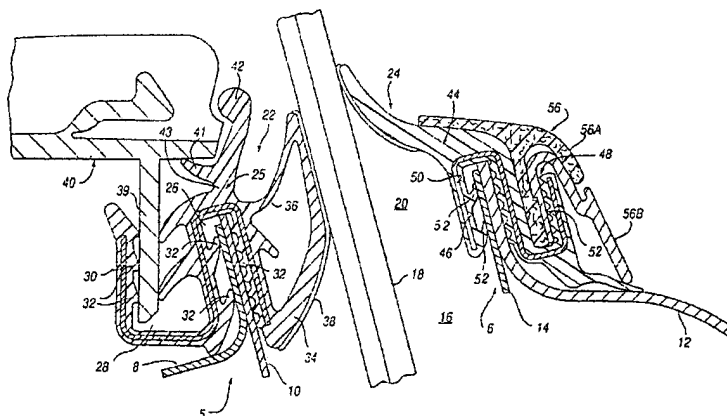
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(54) Title: SEALING, TRIMMING AND FINISHING STRIPS AND VEHICLE DOORS INCORPORATING SUCH STRIPS



(57) Abstract: A vehicle door has inner and outer panel parts (5, 6) defining the hollow interior (16) of the door which supports a rigid frame (not shown) for a window glass (18) which slides into and out of the hollow interior (16) through a waist gap (20) formed by the upper marginal edges of the panel parts (5, 6). Inner and outer waist seals (22, 24) are mounted on the inner and outer panel parts (5, 6) for sealing against the window glass (18) along the waist gap (20). The outer waist seal (24) comprises flexible material (44), preferably extruded, which defines first and second channels (46, 48) facing in opposite directions. The first channel (46) embracingly grips the marginal edge of the outer panel part (6) to support the waist seal (24) in position. The second channel (48) embracingly grips interlocking legs of a decorative strip arrangement (56). The decorative strip arrangement (56) may comprise two separate parts (56A and 56B) presenting contrasting decorative appearances. The decorative strip arrangement (56) can thus be very easily mounted in position, and demounted, simply by clipping it into and unclipping it from the outer channel (48).

SEALING, TRIMMING AND FINISHING STRIPS AND VEHICLE DOORS
INCORPORATING SUCH STRIPS

The invention relates to sealing, trimming and finishing strips and vehicle doors incorporating such strips.

According to the invention, there is provided a sealing, trimming or finishing strip, comprising a channel extending along the length of the strip and adapted to grippingly receive a decorative member.

According to the invention, there is further provided a sealing, trimming or finishing strip for forming a waist seal on the door of a vehicle body to seal along a gap formed in the door through which a window glass carried by the door slides, the strip defining two side-by-side oppositely facing channels, a first one of which is adapted for embracingly gripping a panel part of the door and the second one of which is adapted for embracingly receiving a decorative strip arrangement.

According to the invention, there is also provided a vehicle door, comprising inner and outer panel parts for forming surfaces of the door on the inside and outside of the vehicle and together defining a hollow interior space for the door and carrying a window frame which receives a window glass slidable into and from the hollow interior space through a waist gap formed between marginal edges of the two panel parts, inner and outer waist

seals carried by the marginal edges of the panel parts for sealingly contacting opposite surfaces of the slidable window glass, the outer waist seal being formed of flexible material defining first and second oppositely facing channels extending along the length of the waist seal, the first channel embracingly gripping the marginal edge of the outer door panel part to support the waist seal and the second channel grippingly receiving a decorative strip arrangement presenting a decorative surface facing outwardly of the door.

According to the invention, there is still further provided a sealing, trimming or finishing strip, comprising a first sealing part for contacting a movable surface to be sealed, a channel extending along the length of the strip for embracingly receiving part of an adjacent member, and a second sealing part mounted to be contacted by the adjacent member as the said part thereof enters the channel whereby to cause the second sealing part to be moved into at least partially embracing contact with the adjacent member.

According to the invention, there is also provided a vehicle door, comprising inner and outer panel parts for forming surfaces of the door on the inside and outside of the vehicle and together defining a hollow interior space for the door and carrying a window frame which receives a window glass slidable into and from the hollow interior space through a waist gap formed between marginal edges of the two panel parts and inner and outer waist seals carried by the marginal edges of the panel parts for sealingly contacting opposite surfaces of the slidable window glass, the inner waist seal being formed of flexible material defining first and second oppositely facing channels extending along the

length of the waist seal, the first channel embracingly gripping the marginal edge of the inner door panel part to support the waist seal and the second channel grippingly receiving a first part of a trim panel and mounting it on the inside surface of the door, the flexible material of the inner waist seal carrying an extension which is contacted by a second part of the trim panel as the first part thereof is received by the second channel whereby to cause a flap part of the flexible material to pivot into contact over an edge of the trim panel.

Sealing, trimming and finishing strips embodying the invention, and vehicle doors according to the invention and incorporating such strips, will now be described, by way of example only, with reference to the accompanying diagrammatic drawings in which:

Figure 1 is a cross-sectional view through part of a vehicle door in its "waist" region and showing one of the strips; and

Figure 2 shows a modified form of the strip of Figure 1.

Figure 1 shows a panel part 5 forming the face of a vehicle door on the inside of the vehicle body, and a panel part 6 forming the face of the vehicle door on the outside of the vehicle. The inner panel part 5 comprises metal panels 8 and 10 and the outer panel part 6 comprises metal panels 12 and 14. The inner and outer panel parts 5,6 define a hollow interior space 16 in the lower section of the vehicle door, into and out of which slidingly

moves the window glass 18, which is supported in a rigid window frame (not shown) carried by the lower section of the door.

The window glass 18 slides into and out of the hollow space 16 through a gap 20 (the waist gap) between the upper margins of the panel parts 5,6. In order to provide weather-sealing at the waist gap 20, inner and outer waist seals 22 and 24 are provided.

The inner waist seal 22 comprises plastics, rubber or similar material 25, preferably produced by an extrusion process, which extends longitudinally of the waist gap 20 and is shaped to define a first channel 26 facing in one direction and a second channel 28 facing in the opposite direction. A reinforcing core or carrier 30 made of resilient material, such as metal, is embedded in the extruded material 25 and follows the shapes of the channels 26 and 28. The carrier 30 may be made of unapertured metal. Instead, the metal may be provided with slits or slots or it may comprise a series of double-U shaped metal elements connected together by integral connecting links or entirely disconnected from each other. Instead, looped wire may be used. Other forms of carrier, not necessarily made of metal, can be used.

As shown, the extruded material 25 defines lips 32 on the inside facing walls of the two channels. The lips 32 of the channel 26 make frictional gripping contact with opposite surfaces of the inner panel arrangement 5 and hold the inner waist seal firmly in position on the inside of the vehicle door. The gripping action of the lips 32 is accentuated by the

resilience of the carrier 30.

The extruded material 25 of the inner waist seal 22 integrally carries a flexible sealing lip 34 which is supported by an integral flexible web 36. The flexible lip 34 has a surface 38, advantageously covered with flock or other low friction material, which sealingly bears against the inner face of the window glass 18 to provide sealing as the glass moves vertically upwards and downwards and to seal off the hollow interior 16 of the door. The hollow space defined within the lip 34 and the web 36 includes a small lip integrally extending into the hollow space from the extruded material 25.

The second channel 28 of the inner waist seal 22 grippingly receives a leg part 39 of a trim panel indicated generally at 40 which is carried on and covers the inner face of the vehicle door. The extruded material 25 extends upwardly forming a flap 42 which covers the marginal edge of the trim panel 40. As the leg part 39 of the trim panel 40 is pushed into the channel 28, the trim panel 40 contacts an extension 41 of the flap 42, forcing the flap 42 to pivot about a pivot point 43 so that the flap covers the edge of the trim panel 40.

The outer waist seal 24 is also formed from plastics, rubber, or similar flexible material 44, again preferably formed by an extrusion process. The material 44 defines channels 46 and 48 facing in opposite directions and incorporates a reinforcing core or carrier 50 which may have a construction similar to that of the carrier 30.

Channel 46 embraces the marginal edge of the outer panel part 6. Inwardly directed gripping lips 52 within the channel 46 (and generally similar to the gripping lips 32 of the inner waist seal 22) frictionally grip opposite surfaces of the panel part 6 and ensure that the outer waist seal 24 is therefore firmly supported on the outside of the waist gap 16. The outer waist seal 24 integrally defines a flexible lip 54 which has a surface 56 preferably carrying flock or other low friction material which is in sealing contact with the outer face of the window glass 18.

The outer channel 48 of the outer waist seal 24 grippingly supports a decorative strip arrangement 56. The decorative strip arrangement 56 comprises two separate members extending longitudinally along the length of the waist gap 20, comprising an upper curved member 56A which is relatively rigid and may be formed to present a bright finish. It may, for example, comprise polished metal or chromium-plated metal. It partially overlays the upper surface of the lip 54. The lower strip member 56B may be made of rigid plastics or similar material and presenting a contrasting colour, such as having a black finish. Both strip members 56A, 56B carry legs which, in this example, are formed to interlock with each other and to be a tight frictional fit within the channel 48. As shown in the Figure, a series of small gripping lips 52 are arranged along one inner face of the channel 48 to help to secure the decorative strip arrangement 56 within the channel 48. However, gripping lips could be provided on both faces of the channel 48.

The extruded material 44 of the outer waist seal 24 includes a lower lip 58 which sealingly bears against the outer panel 12 of the door.

In this way, the outer waist seal 24 grippingly supports the decorative strip arrangement 56 which can thus be easily mounted in position, during assembly of the vehicle, simply by clippingly inserting the interlocking legs of the decorative strip arrangement into the second channel 48 of the waist seal. The use of separate clips or other fastenings is no longer necessary.

The decorative strip arrangement 56 can have any suitable shape, colour or finish. Although Figure 1 shows a decorative strip arrangement comprising two separate strip members 56A and 56B with contrasting finishes, this is not essential: other forms of decorative strip arrangement can be used instead, including strip arrangements comprising only a single strip member.

In the strip shown in Figure 2, similar items are similarly referenced. In the strip of Figure 2, the small lip inside the hollow space defined by the lip 34 and the web 36 is enlarged as shown at 58 and helps to prevent rattling of the glass 18.

CLAIMS

1. A sealing, trimming or finishing strip for forming a waist seal (24) on the door (6,7) of a vehicle body to seal along a gap (20) formed in the door (6,7) through which a window glass (18) carried by the door (6,7) slides, the strip defining two side-by-side oppositely facing channels (46,48), a first one (46) of which is adapted for embracingly gripping a panel part (6) of the door, characterised in that the second channel (48) is adapted for embracingly receiving a decorative strip arrangement (56).
2. A strip according to claim 1, characterised by a lip (44) integrally extending from the base of the first channel (46) for sealingly contacting the window glass (18), the decorative strip (56) arrangement when received in the second channel (48) at least partially overlying a surface of the lip (44).
3. A strip according to claim 2, characterised in that the decorative strip arrangement (56) when received in the second channel (48) also extends towards the panel part (6) of the door.
4. A strip according to claim 2 or 3, characterised in that the decorative strip arrangement (56) comprises two separate strip parts (56A,56B) of contrasting appearance.

5. A vehicle door, comprising inner and outer panel parts (7,6) for forming surfaces of the door on the inside and outside of the vehicle and together defining a hollow interior space (20) for the door and carrying a window glass (18) slidable into and from the hollow interior space (16) through a waist gap (20) formed between marginal edges of the two panel parts (7,6), inner and outer waist seals (22,24) carried by the marginal edges of the panel parts (7,6) for sealingly contacting opposite surfaces of the slidable window glass (18), characterised in that the outer waist seal (24) is formed of flexible material defining first and second oppositely facing channels (46,48) extending along the length of the waist seal (24), the first channel (46) embracingly gripping the marginal edge of the outer door panel part (6) to support the waist seal (24) and the second channel (48) grippingly receiving a decorative strip arrangement (56) presenting a decorative surface facing outwardly of the door.

6. A door according to claim 5, characterised in that flexible material of the outer waist seal (24) defines a flexible lip (44) extending from the base of the first channel (46) into sealing contact with the window glass (18), and the decorative strip arrangement (56) has a part partially overlying a surface of the lip (44).

7. A door according to claim 6, characterised in that the decorative strip arrangement (56) has another part (56B) which extends towards an outside surface of the outer panel part (6) of the door.

8. A door according to claim 7, characterised in that the decorative strip arrangement (56) comprises two separate parts (56A,56B) presenting contrasting decorative appearances.

9. A door according to claim 8, characterised in that the two parts (56A,56B) of the decorative strip arrangement (56) define interlocking legs grippingly received in the second channel (48).

10. A door according to any one of claims 5 to 9, characterised in that the inner waist seal (22) comprises flexible material defining a channel (26) for embracingly gripping the marginal edge of the inner panel part (7) of the door for mounting the inner waist seal (22) in position in which part of the flexible material (34) sealingly bears against the window glass (18).

11. A door according to claim 10, characterised in that the flexible material of the inner waist seal (22) defines a further channel (28), facing in the opposite ⁷direction to its first-mentioned channel (26), the further channel (28) embracingly receiving and supporting a trim part (40) extending at least partially over the inner panel part of the door (7).

12. A door according to claim 5, characterised in that flexible material (34) of at least one of the waist seals defines a hollow interior the outside of which is positioned to

contact against the window glass (18) and in which is positioned a flexible lip (60) arranged to be capable of being flexed in response to contact between the outside of the hollow interior and the glass (18) and to tend to prevent rattling of the glass (18).

13. A door according to any one of claims 5 to 12, characterised in that the flexible material of one or both of the waist seals (22,24) is reinforced with a or a respective reinforcing core or carrier (30,50).

14. A sealing, trimming or finishing strip, comprising a first sealing part (34) for contacting a movable surface (18) to be sealed, characterised by a channel (28) extending along the length of the strip for embracingly receiving part of an adjacent member (40), and a second sealing part (41,42) mounted to be contacted by the adjacent member (40) as the said part thereof enters the channel (28) whereby to cause the second sealing part (41,42) to be moved into at least partially embracing contact with the adjacent member (40).

15. A strip according to claim 14, characterised in that the first sealing part (34) is carried by means defining a further channel (26) for embracingly gripping a mount (8,10) whereby to mount the strip next to the movable surface (18).

16. A strip according to claim 14 or 15, characterised in that the two channels (26,28) face in opposite directions.

17. A strip according to any one of claims 14 to 16, characterised in that the adjacent member (40) is a trim panel on a vehicle.

18. A strip according to claim 17, characterised in that the trim panel (40) is a trim panel on a vehicle door and the movable surface (18) is the surface of a window glass carried by the door.

19. A strip according to any one of claims 14 to 18, characterised in that the first sealing part (34) defines a hollow interior the outside of which contacts the movable surface (18) in use and in which is positioned a flexible lip (60) arranged to be capable of being flexed in response to contact between the outside of the hollow interior and the movable surface (18) and to tend to prevent rattling of the movable surface (18).

20. A vehicle door, comprising inner and outer panel parts (7,6) for forming surfaces of the door on the inside and outside of the vehicle and together defining a hollow interior space (16) of the door and carrying a window glass (18) slidable into and from the hollow interior space (16) through a waist gap (20) formed between marginal edges of the two panel parts (7,6), and inner and outer waist seals (22,24) carried by the marginal edges of the panel parts (7,6) for sealingly contacting opposite surfaces of the slidable window glass (18), the inner waist seal (22) being formed of flexible material, and characterised in that the flexible material defines first and second oppositely facing channels (26,28) extending along the length of the waist seal, the first channel (26) embracingly gripping

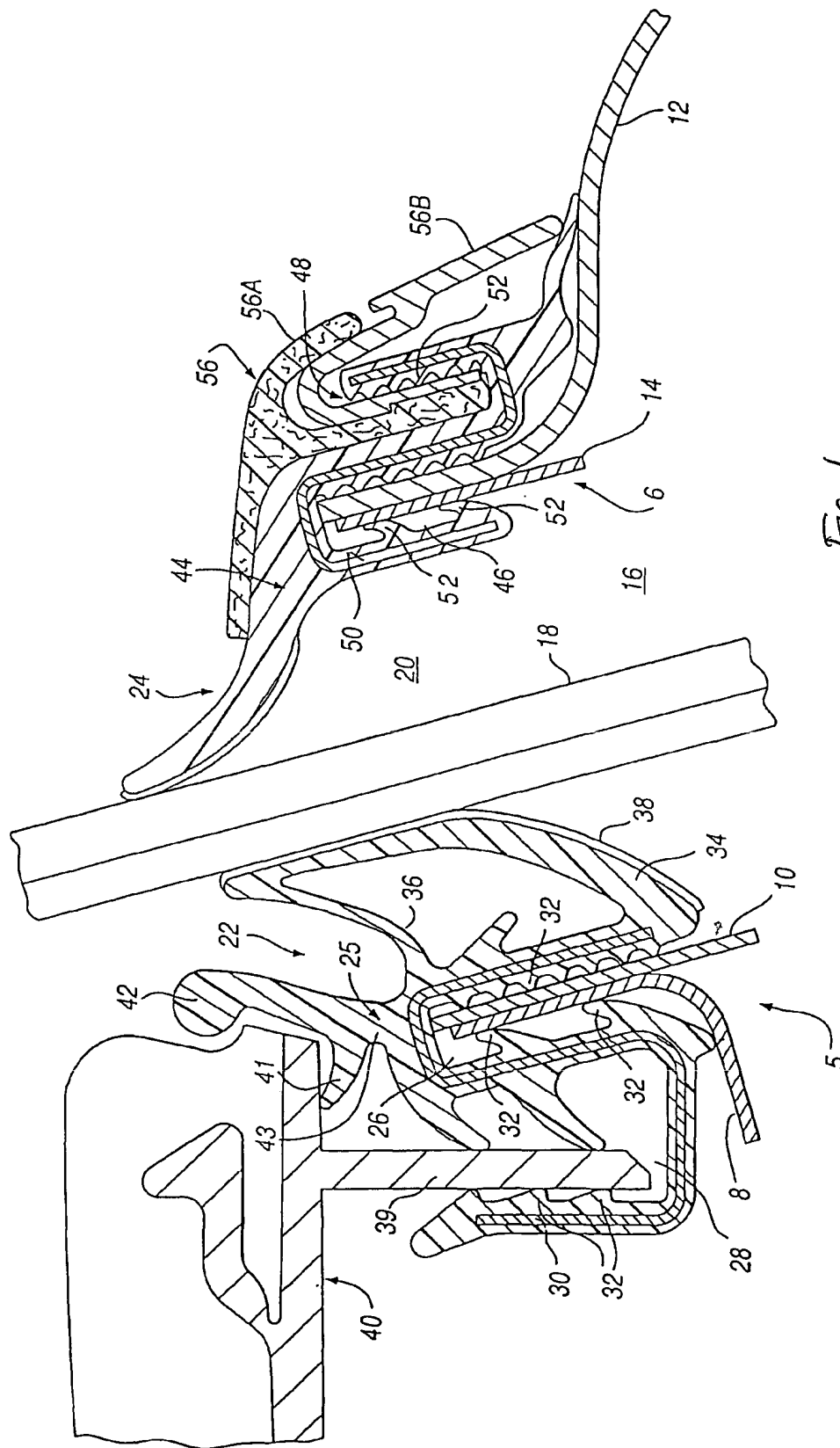
the marginal edge of the inner door panel part (7) to support the waist seal (22) and the second channel (28) grippingly receiving a first part (39) of a trim panel (40) and mounting it on the inside surface of the door, the flexible material of the inner waist seal (22) carrying an extension (41) which is contacted by a second part of the trim panel (40) as the first part (39) thereof is received by the second channel (28) whereby to cause a flap part (42) of the flexible material to pivot into contact over an edge of the trim panel (40).

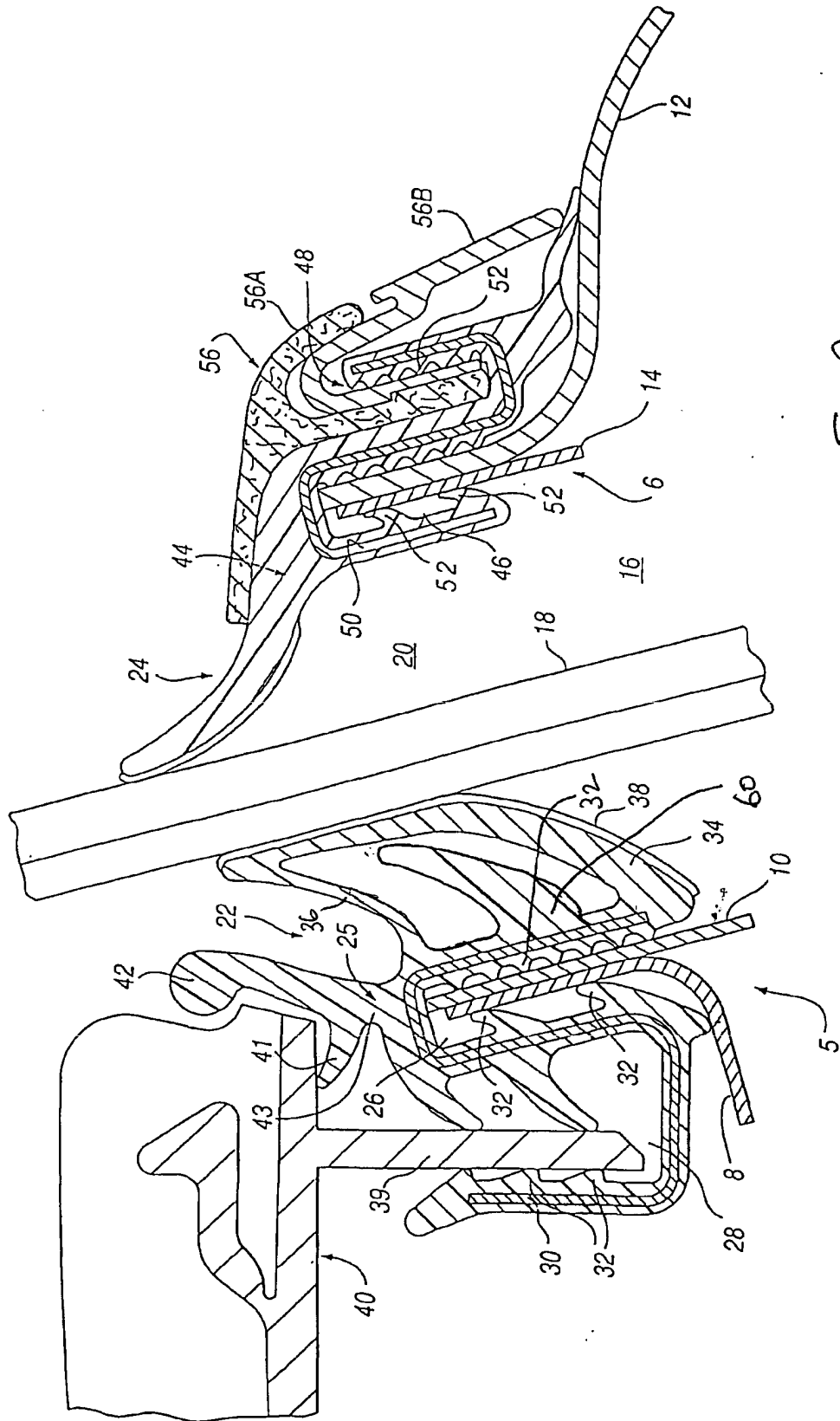
21. A door according to claim 20, characterised in that the outer waist seal (24) comprises flexible material defining a channel (46) for embracingly gripping the marginal edge of the outer panel part (6) of the door for mounting the outer waist seal (24) in position in which part of the flexible material sealingly bears against the window glass (18).

22. A door according to claim 21, characterised in that the flexible material of the outer waist seal (24) defines a further channel (48), facing in the opposite [?] direction to its first-mentioned channel (46), the further channel (48) embracingly receiving and supporting a decorative strip arrangement (56).

23. A door according to any one of claims 20 to 22, characterised in that the flexible material of one or both of the waist seals (22,24) is reinforced with a or a respective reinforcing core or carrier (30,50).

24. A door according to any one of claims 20 to 23, characterised in that the flexible material (34) of the inner waist seal (22) defines a hollow interior the outside of which is positioned to contact against the window glass (18) and in which is positioned a flexible lip (60) arranged to be capable of being flexed in response to contact between the outside of the hollow interior and the glass (18) and to tend to prevent rattling of the glass (18).





INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 01/00622

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B60J10/04 B60J10/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B60J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 441 073 A (HUTCHINSON SA) 14 August 1991 (1991-08-14)	1,5
A	column 3, line 21-51; figures 1-6 ---	14,20
X	EP 0 822 109 A (DRAFTEX IND LTD) 4 February 1998 (1998-02-04)	1,5
A	column 2, line 28 -column 3, line 3; figures 1-7 ---	13,14, 20,23
A	EP 0 747 265 A (DRAFTEX IND LTD) 11 December 1996 (1996-12-11) figures 1-5 ---	1,13,20
A	EP 0 285 925 A (METZELER GMBH ;BAYERISCHE MOTOREN WERKE AG (DE)) 12 October 1988 (1988-10-12) figure 6 ---	1,13,20
	--- -/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- *A* document defining the general state of the art which is not considered to be of particular relevance
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 01/00622

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 298 07 479 U (METZELER AUTOMOTIVE PROFILES) 16 July 1998 (1998-07-16) figures 7,8 ---	1,13,14, 20,23
A	US 4 949 507 A (VAUGHAN ROBERT A) 21 August 1990 (1990-08-21) figure 7 ---	1,13,20
A	US 5 199 760 A (VERING HEINZ) 6 April 1993 (1993-04-06) figure 1 -----	2-4,6,8, 12,19,24

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IB 01/00622

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0441073 A	14-08-1991	FR 2657824 A DE 69008704 D DE 69008704 T ES 2056420 T	09-08-1991 09-06-1994 18-08-1994 01-10-1994
EP 0822109 A	04-02-1998	GB 2315798 A	11-02-1998
EP 0747265 A	11-12-1996	GB 2302120 A DE 69601662 D DE 69601662 T ES 2129926 T	08-01-1997 15-04-1999 02-12-1999 16-06-1999
EP 0285925 A	12-10-1988	DE 3801073 A DE 3866916 A DE 3866916 D ES 2029293 T	27-10-1988 30-01-1992 30-01-1992 01-08-1992
DE 29807479 U	16-07-1998	NONE	
US 4949507 A	21-08-1990	AU 647422 B AU 6588090 A BR 9006335 A CA 2028774 A,C DE 69021357 D DE 69021357 T DE 69032289 D DE 69032289 T EP 0437974 A EP 0659602 A JP 3137638 B JP 3213425 A US 5042201 A	24-03-1994 25-07-1991 04-08-1992 19-07-1991 07-09-1995 04-01-1996 04-06-1998 20-08-1998 24-07-1991 28-06-1995 26-02-2001 18-09-1991 27-08-1991
US 5199760 A	06-04-1993	DE 4110824 A DE 59200884 D EP 0507231 A ES 2065097 T JP 2041090 C JP 5096954 A JP 7067886 B	08-10-1992 19-01-1995 07-10-1992 01-02-1995 09-04-1996 20-04-1993 26-07-1995